

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

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PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing
(day/month/year) 10 JAN 2005Applicant's or agent's file reference
10104SG242FOR FURTHER ACTION
See paragraph 2 below

International application No.

PCT/SG2004/000366

International filing date (day/month/year)

6 November 2004

Priority date (day/month/year)

6 November 2003

International Patent Classification (IPC) or both national classification and IPC

Int. Cl. H04N 1/415, 1/64, G06T 9/00

Applicant:

NATIONAL UNIVERSITY OF SINGAPORE et al

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability, citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the IPEA/AU

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**WRITTEN OPINION OF THE
 INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/SG2004/000366

Box No. 1 **Basis of the opinion**

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/SG2004/000366

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | |
|-------------------------------|-------------|-----|
| Novelty (N) | Claims 1-15 | YES |
| | Claims | NO |
| Inventive step (IS) | Claims | YES |
| | Claims 1-15 | NO |
| Industrial applicability (IA) | Claims 1-15 | YES |
| | Claims | NO |

2. Citations and explanations:

- D1: US 5,778,092 A (MACLEOD et al), 7 July 1998
- D2: US 5,778,095 A (DAVIES), 7 July 1998
- D3: EP 0 713 329 A1
- D4: US 6,324,305 B1 (HOLLADAY et al), 27 November 2001
- D5: US 6,163,625 A (NG et al), 19 December 2000
- D6: US 5,392,362 A (KIMURA et al), 21 February 1995
- D7: G. E. Kopec et al, *Document-Specific Character Template Estimation*
- D8: J. Li et al, *Context-Based Multiscale Classification of Document Images Using Wavelet Coefficient Distributions*
- D9: R. de Queiroz et al, *Mixed Raster Content (MRC) Model for Compound Image Compression*
- D10: *WDIC - Wavelet-Based Document Image Compression*, as archived on 22 February 2002
<http://web.archive.org/web/20020422002439/www.cwaip.nus.edu.sg/demo/wdic.htm>

INVENTIVE STEP (IS) claims 1-15

Claims 1-15: These claims do not involve an inventive step in light of document D1, when combined with D2. (This is an obvious combination, since D1 explicitly directs the reader to D2 on column 5, line 28.)

D1 discloses a method for compressing a document image by dividing it into text, image and background areas. (The segmentation of document images in this way is also considered to be well known in the art.) For compression of the extracted text, D1 uses the method of D2, which discloses the compression of character areas within a document image using dynamically generated character templates. The final step of claim 1, in which an SA quantization wavelet encoder is used to compress the background image, is not disclosed in D1, however the use of this well-known compression technique would be an obvious choice for a person skilled in the art when performing the cited invention.

The features of the dependent claims, when not disclosed in D1, relate to well known aspect of this field, or to details of implementation, and are not seen to confer an inventive step to the claims.

The remaining documents do not deprive the claimed invention of novelty or inventive step. In particular, the use of dynamically generated character templates is not disclosed by any of D3-D6 or D8-D10, and is seen to inventively distinguish the claimed invention from them. (It is noted that, while D10 is a partial disclosure by the applicant, it does not reveal the use of dynamically generated templates during compression of character segments.) While D7 does disclose the dynamic generation of character templates, it is in the context of character recognition, and there is no obvious motivation to apply it to the compression of text segments of a document image.